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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,612	04/05/2000	Brian T. Cunningham	DR-308J	6510

7590 06/18/2004

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EXAMINER	
CHAPMAN JR, JOHN E	
ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/543,612	CUNNINGHAM ET AL.	
	Examiner	Art Unit	
	John E Chapman	2856	

-- The MAILING DATE of this communication app ars on th cover sheet with th correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 31-33 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 31, there is no proper antecedent basis for "said flexural plate wave sensor." Hence, it is not clear what elements recited in claim 30 are "formed from a silicon substrate." Furthermore, there is no proper antecedent basis for "said membrane" in line 2.

Regarding claim 32, there is no proper antecedent basis for "said flexural plate wave sensor" and "said membrane." In addition, a transducer is recited in claim 30. Hence, claim 32 appears to be introducing a second and third transducer.

Regarding claim 42, picogram/mm^2 is not a unit of mass, but rather is mass/area (i.e., surface density).

3. Claims 26-40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Bowers.

White et al. discloses a sensor for measuring the mass of a substance on a membrane and teaches employing the sensor as a deposition monitor for use in an evaporation or sputtering system (col. 11, line 61, to col. 12, line 4). White et al. does not mention using the apparatus to determine the concentration of a non-volatile residue. Bowers teaches metering a known volume

of liquid 55 in Fig. 7 on a SAW resonator 52 and allowing the liquid to evaporate in order to measure the level (i.e., concentration) of non-volatile residue in the liquid. Note col. 14, lines 30-49. It would have been obvious in view of Bowers to provide a known volume of a liquid on the sensor of White et al. and allowing the liquid to evaporate in order to measure the level of non-volatile residue in the liquid. Merely to use the evaporation sensor of White et al. in the evaporation system of Bowers would have been within the level of ordinary skill in the art.

Regarding claims 27 and 29-32, White et al. discloses a plate wave resonator in Fig. 11a having a membrane layer 111 whose resonant frequency is determined by the properties of the surrounding environment, including the mass of a loading fluid.

Regarding claim 22, Bowers teaches depositing a volatile solution on the resonator. Note col. 12, lines 18-28.

Regarding claim 32, White et al. teaches providing a plurality of transducers 109 (col. 15, line 9). The transducers appear to be piezoelectric and, if not, it would have been obvious to provide transducers comprising a piezoelectric layer 46 in Fig. 4.

Regarding claim 39, it is well known in the art, and would have been obvious, to provide a means to display the mass of the substance. Note col. 11, lines 27-29, of White et al.

Regarding claim 42, the apparatus of White et al. appears to inherently be capable of measuring a change of mass of a substance within the subnanogram range, and, if not, merely to increase the range of sensitivity of the device would have been obvious.

4. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Bowers as applied to claim 28 above, and further in view of Ballato.

The only further difference between the claimed invention and the prior art consists in providing an array of sensors. Ballato teaches providing an array of sensors in order to sense the presence of a plurality of chemical agents. It would have been obvious in view of Ballato to provide an apparatus comprising an array of sensors of White et al. in order to sense the presence of a plurality of chemical agents.

5. Applicant's arguments filed on 9 April 2004 have been fully considered but they are not persuasive. Applicant argues that the combination of White et al. and Bowers is improper since White et al. teach away from combining it with a reference such as Bowers, specifically, since White et al. teach against the use of SAW sensing devices. However, Bowers has not been relied upon to suggest modifying the apparatus of White et al. to use a SAW sensing device. There is no necessity, either in the operation of the device or in the claimed subject matter, to use a SAW sensing device. Bowers has been relied upon only to suggest the utility of the apparatus of White et al. for determining the concentration of a non-volatile residue. White et al. discloses a sensor that may be employed as a deposition monitor for use in an evaporation system, while Bowers discloses an evaporation system in which a known volume of liquid is deposited on a sensor and allowed to evaporate in order to measure the level (i.e., concentration) of non-volatile residue in the liquid. Hence, Bowers is relied upon merely to suggest a particular utility for the sensor of White et al., namely, in a particular evaporation system that may employ the sensor of White et al. as a deposition monitor. The level of ordinary skill in the resonant sensor art is high, and it is within the level of ordinary skill in the art to seek to extend the utility of a resonant sensor of general utility to applications of particular utility. Accordingly, it would have been within the

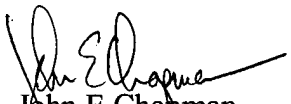
level of ordinary skill in the art to seek to extend the utility of the resonant sensor of White et al. as a deposition monitor in an evaporation system to the specific utility as a deposition monitor in an evaporation system for measuring the level of non-volatile residue in the liquid, and Bower would have suggested such specific utility to one of ordinary skill in the art.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John E Chapman whose telephone number is (571) 272-2191. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John E Chapman
Primary Examiner
Art Unit 2856